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Title of the Invention: CAN TOP
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CLAIMS:

1) A can top comprising a plate-like chuck panel positioned between a chuck wall that is to be rolled and connected to a can body and a center panel constituting a central portion of said can top in such a manner that said plate-like chuck panel is inclined at 20 to 70 degrees relative to a horizontal plane.

2) A can top as set forth in Claim 1, wherein said inclined angle of said chuck wall relative to said horizontal plane is about 45 degrees.

3) A can top as set forth in Claim 1 or 2, wherein said center panel takes a form which is curved and expanded axially outwardly of said can.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a can top for use for an internally pressurized can such as an aerosol can, a carbonated beverage can or the like.

A conventional can top for use for a can such as an aerosol can and a carbonated beverage can to which an internal pressure is applied comprises a center panel and a chuck wall which are concentrically continuous. Namely, as shown in Figs. 1 and 2, can tops 2a, 2b for use for a conventional aerosol can 1a and a carbonated beverage can 1b comprise concentric center panels 3a, 3b constituting central portions thereof and chuck walls 5a, 5b having at outer circumferential edge portions thereof

rolled flanges 4a, 4b that are rolled and secured to can bodies 7a, 7b, and the center panels and the chuck walls 5a, 5b are connected by chuck wall radii 6a, 6b which are each formed into R.

However, in the cans 1a, 1b comprising those can tops 2a, 2b, in a case where an excessive internal pressure is applied thereto, the center panels 3a, 3b are forcibly raised by virtue of the internal pressure, and the chuck wall radii 6a, 6b and the chuck walls 5a, 5b are deformed in such a manner as to be turned over and, finally, they sometimes buckle. In order to reduce this buckling, the size of the center panels 3a, 3b may be reduced to thereby reduce, in turn, the internal pressure applied thereto, but if the center panels 3a, 3b are made smaller, in other words, a reduction in the diameters Da, Db of the chuck wall radii 6a, 6b means an increase in the width of the chuck wall radii 6a, 6b. As a result of such an increase, the moment acting on the chuck wall radii 6a, 6b increases, and this facilitates the deformation, and therefore, the pressure resistance is rather reduced. Thus, in view of this situation, it has long been desired that a can top having high pressure resistance is developed.

Problem

This invention was made in view of the aforesaid situation, and an object thereof is to provide a can top for internally pressurized cans which can realize high pressure resistance with a simple construction and which can reduce the volume of raw material used.

Solution

With a view to attaining the aforesaid object, according to the present invention, there is provided a can top comprising a plate-like chuck panel positioned between a chuck wall that is to be rolled and connected to the can body and a center panel constituting a central portion of the top can in such a manner that the center panel inclines at 20 to 70 degrees relative to the horizontal plane.

Referring to the drawing showing one embodiment of the present invention, the details of the invention will be described below.

In Fig. 3, reference numeral 11a denotes an aerosol can, and this aerosol can 11a comprises a can top 12a which is to be rolled and secured to a can body 17a. The can top 12a comprises concentrically a center panel 13a normally called a spectacle top which constitutes a central portion of the can top 12a, a chuck wall 15a having at an outer circumferential edge portion thereof a rolled flange 14a which is to be rolled and secured to the can body 17a and a chuck wall radius 16a. In a case where the can top 12a is rolled to the can body 17a, the chuck wall 15a is put in a state in which the chuck wall is joined to and pressed against the inside of the can body 17a. In addition, the chuck wall radius 16a exhibits an arc-like cross section which opens upwardly and becomes continuous with the outer circumferential edge portion. What is particularly important here is that the can top 12a comprises a chuck panel 18 between the center panel 13 and the chuck wall 15a. The chuck panel 18a is formed into an annular plate-like shape and communicates with an inner lower end portion of the chuck wall 15a at the outer circumferential edge portion thereof. Additionally, the chuck panel 18a connects to the center panel 13a via the chuck wall radius 16a at an inner circumferential edge portion. The chuck panel 18a inclines at a predetermined inclined angle θ relative to the horizontal plane. Preferably, this inclined angle θ ranges from 20 degrees to 70 degrees.

An embodiment shown in Fig. 4 is an example in which the present invention is applied to a carbonated beverage can. Namely, reference numeral 11b denotes a carbonated beverage can, and similarly to the aerosol can 11a shown in Fig. 3, the carbonate beverage can 11b comprises a can top 12b that is rolled to a can body 17b. The can top 12b comprises concentrically

a center panel 13b constituting a central portion of the can top 12b, a chuck wall 15b having at an outer circumferential edge portion thereof a rolled flange 14b which is rolled and secured to the can body 17b and a chuck wall radius 16b. In a case where the can top 12b is rolled to the can body 17b, the chuck wall 15b is put in a state in which it is joined to and pressed against the inside of the can body 17b. Additionally, the chuck wall radius 16b exhibits an arc-like cross-section which opens upward and becomes continuous with an outer circumferential edge portion of the center panel 13b. Here, what is particularly important is that the can top 12b comprises a chuck panel 18b between the center panel 13b and the chuck wall 15b. The chuck panel 18b is formed into an annular plate-like shape and communicates with an inner lower end portion of the chuck wall 15b at an outer circumferential edge portion thereof. Additionally, the chuck panel 18b connects to the center panel 13b via the chuck wall radius 16b at an inner circumferential edge portion thereof. The chuck panel 18b inclines at a predetermined inclined angle θ relative to the horizontal plane. Preferably, this inclined angle θ ranges from 20 degrees to 70 degrees. Note that the shape of the center panel 13b may be a flat plate-like shape as shown in Fig. 4, but as shown in Fig. 5, if the center panel 13b is formed in advance through plastic processing into a curved and expanded shape so as to exhibit a semi-circular arc-like or semi-oval arc-like cross sectional shape, it is possible to enhance the pressure resistance of a can top 12b' relative to the internal pressure thereof.

In a case where the can tops 12a, 12b, 12b' constructed as described above are rolled to the can bodies 17a, 17b for use as can tops of the cans 11a, 11b to which the internal pressure is applied, the areas of the center panels 13a, 13b, 13b' become smaller by, respectively, areas corresponding to

projected areas of the chuck panels 18a, 18b, and this reduces their pressure receiving areas, respectively, whereby axial loads acting thereon become smaller, thereby making it possible to reduce the thickness required to secure the predetermined pressure resistance. Moreover, as a result of the inclined chuck panels 18a, 18b, not all the axial loads acting on the center panels 13a, 13b, 13b' act on the chuck panels 18a, 18b as lateral loads causing a flexure deformation, but part of the lateral loads is dispersed as axial loads of the chuck panels 18a, 18b, and therefore, the flexure of the chuck panels 18a, 18b is also reduced. After all, as a whole, the can tops 12a, 12b, 12b' each have a large mechanical strength against buckling. It is made clear from the results of experiments that the inclined angle θ of the chuck panels 18a, 18b preferably ranges from 20 to 70 degrees.

[Embodiment]

(1) Results of experiments on aerosol cans (can body diameter 52.3mm)

	Plate thickness (mm)	Pressure resistance (Kg/cm^2)	Diameter of chuck wall radius (mm)	Inclined angle of chuck panel	Shape of center dome
Prior art top	0.32	14.8	49.90	-	Fig. 1
Improved top No. 1	0.32	20.8	42.00	45°	Fig. 3
Improved top No. 2	0.27	14.8	"	"	Fig. 3

(2) Results of experiments on carbonated beverage cans (can body diameter 65.35mm)					
	Plate thickness (mm)	Pressure resistance (Kg/cm^2)	Diameter of chuck wall radius (mm)	Inclined angle of chuck panel	Shape of center panel
Prior art top	0.32	7.0	61.00	-	Fig. 2
Improved top No. 1	0.32	8.5	52.50	45°	Fig. 4
Improved top No. 2	0.28	7.2	"	"	Fig. 4
Improved top No. 3	0.32	9.1	"	"	Fig. 5
Improved top No. 4	0.26	6.7	"	"	Fig. 5

It was found from the results of the experiments shown above that the thickness of the sheet metal can be reduced by 0.05mm for the top can for the aerosol can and 0.06mm for the top can for the carbonated beverage can by adopting the present invention.

As is clear from the aforesaid description, according to the present invention, there is provided the can top for the internally pressurized can which can realize the high pressure resistance with the simple construction and can aim at reducing the volume of material used.

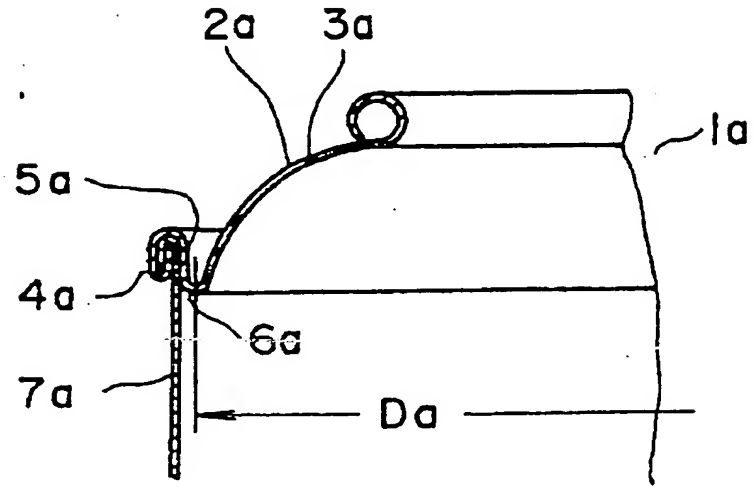
BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a vertical sectional view showing a can top for a conventional aerosol can, Fig. 2 is a vertical sectional view showing a can top for a conventional carbonated beverage can, Fig. 3 is a vertical sectional view showing a can top for an aerosol can according to one embodiment of the present invention, Fig. 4 is a vertical sectional view showing a can top for a carbonated beverage can according to another embodiment of the

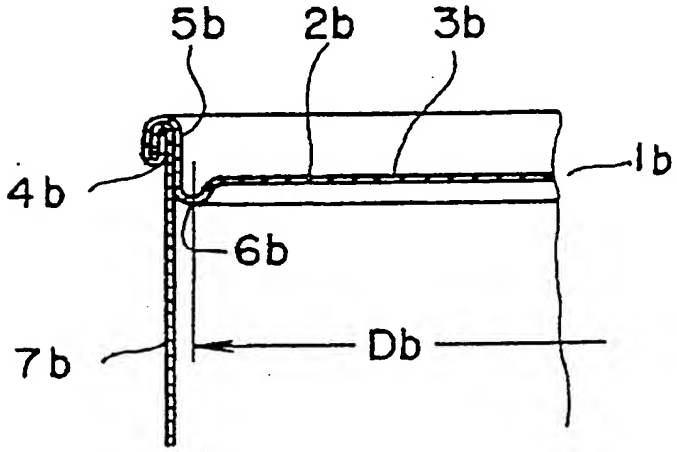
present invention, and Fig. 5 is a vertical sectional view showing a can top for a carbonated beverage can according to another embodiment of the present invention.

12a, 12b, 12b': can top; 13a, 13b, 13b': center panel; 14a, 14b: rolled flange; 15a, 15b: chuck wall; 16a, 16b: chuck wall radius; 17a, 17b: can body; 18a, 18b: chuck panel.

第 1 図



第 2 図



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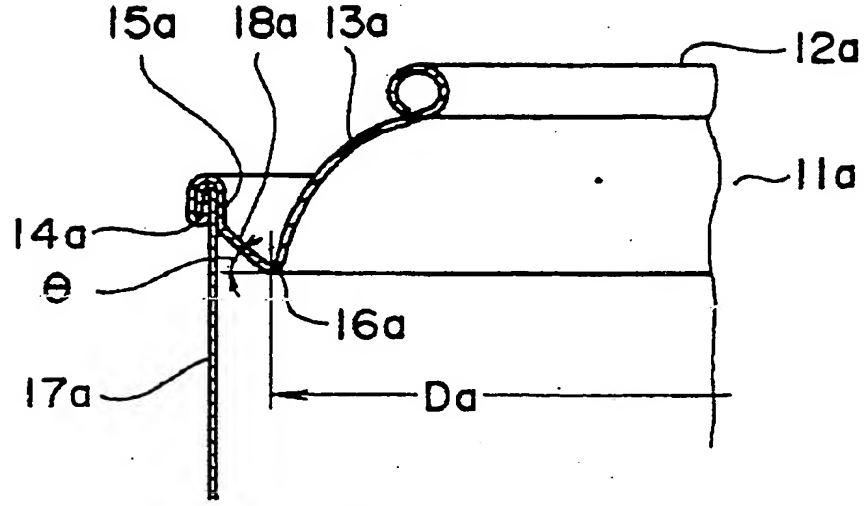
第 3 図



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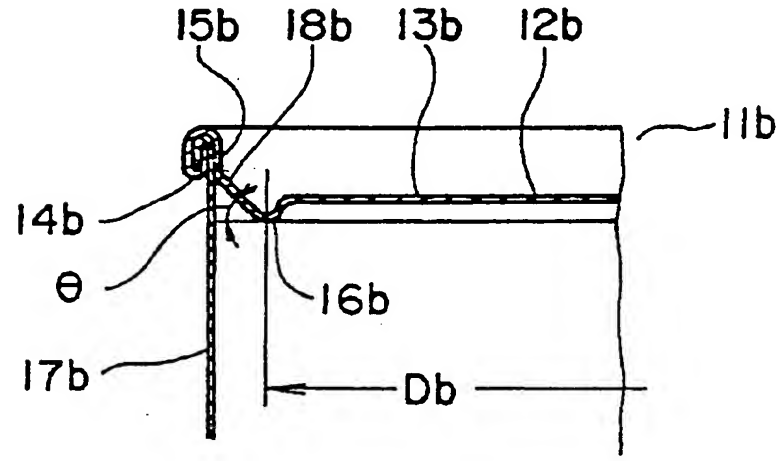

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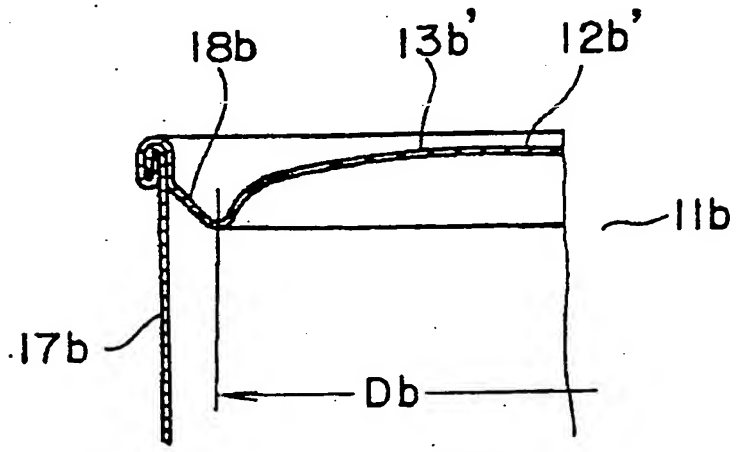
第 5 図



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